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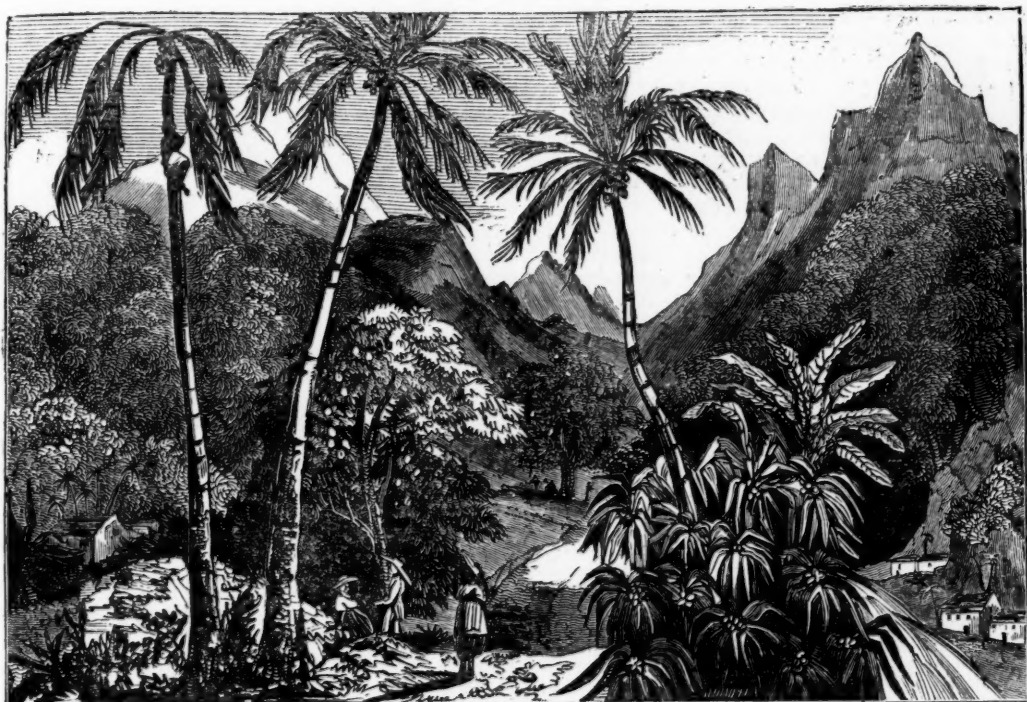
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UNDER THE DIRECTION OF THE COMMITTEE OF GENERAL LITERATURE AND EDUCATION
APPOINTED BY THE SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE.

POLYNESIA.



VIEW IN THE ISLAND OF FARE, (FROM TYERMAN'S JOURNAL.)

I.

SITUATION AND DISCOVERY OF POLYNESIA—GENERAL
APPEARANCE OF THE ISLANDS—VEGETABLE PRO-
DUCTIONS.

THAT numerous cluster of islands situated in the bosom of the Southern or Pacific Ocean, and denominated POLYNESIA, has been an object of great interest ever since the publication of the splendid discoveries of Captain Cook. Few, indeed, are those who have read the delightful accounts of these islands, and of their amiable and interesting inhabitants, without wishing to possess a further knowledge of them. But the transient visits of travellers, whether engaged in scientific researches or commercial enterprises, afford but slender opportunities for investigating the history or character of a people, whose customs, manners, and language, bear no analogy to their preconceived ideas. Much of the desired information has, however, been furnished by various Missionaries, some of whom have been engaged, for more than thirty years, in the great work of spreading Christianity amongst the inhabitants of the South Sea Islands. During that time, they have acquired such a knowledge of their history, manners, laws, religion, &c., as enables them to furnish accounts of the highest interest. This, however, has been but a collateral part of their labours. By their instructions, and by their examples, during so long a residence, they have acquired a moral influence over the natives, which has produced

the most extraordinary effects. In those islands more immediately within the sphere of their influence, a complete revolution has been effected, by which the whole character both of the people and of the government is changed; so that from being a nation of savage idolaters, addicted to every vice that stains and degrades the human character, many of them have renounced idolatry, abolished their barbarous ceremonies, embraced Christianity, and adopted European customs, and the civil and domestic arts of life.

The following sketch of these islands, with a brief detail of the changes which have taken place, is chiefly founded on the *Polynesian Researches* of Mr. Ellis, a work which has excited considerable interest, on account of the vivid delineations, the scientific details, and the great mass of general information, with which it abounds.

The Southern Ocean itself was made known to Europeans by Vasco Nunez de Balboa, in 1513. From the summit of the Cordilleras, which stretch across the Isthmus of Darien, that bold and enterprising Spaniard solved the problem which had baffled the skill of Columbus himself, and beheld the vast Pacific spread before him in all its majesty. A few years after, Magellan, a Portuguese, being despatched by the court of Spain to ascertain the exact situation of the Molucca Islands, sailed westward, and after coasting along the eastern shores of South America, discovered the Straits that bear his name; and pass-

ing through these, launched the first ship of Europe in the Southern Ocean. Boldly pursuing his way across the previously untraversed surface of that immense ocean, he discovered the Ladrone and the Philippine Islands, at one of which he was unfortunately killed in a rencontre with the natives. His company, having ultimately accomplished the object of their voyage, returned to Europe, having performed in their ship, the *Victory*, the first voyage round the world.

Other navigators, of different nations, have since, from time to time, followed the course of Magellan, and have enriched the stores of geographical knowledge by their discoveries in that part of the globe; and the number of islands that presented themselves to these enterprising travellers, suggested the title of *POLYNESIA* for the whole group. None of these voyages of discovery, however, have excited so lively a sensation, or produced so deep an impression, as those performed by Captain Cook, in the latter part of the eighteenth century; which drew the attention of mankind from the western world to these clusters of islands, spread over the bosom of the Pacific, of which Otaheite, or, as it is now denominated, Tahiti, was the principal object of his description, and has indeed since been the central point of European communication, and the chief theatre of those changes which have taken place.

The extent of ocean covered by these groups of islands is very great, embracing 80 degrees of latitude on either side of the Equator, and 110 degrees of longitude east and west of the antipodal meridian of London. This immense space is studded with innumerable islands, continually increasing in number, from a cause we shall presently have occasion to mention.

The origin of these islands is various. Some have undoubtedly existed from the Creation, as is inferred from their geological structure, described by Mr. Ellis, which exhibits the primitive formations to a considerable extent. Others, again, are of volcanic structure; but numbers, and perhaps the far greater proportion, owe their origin to that wonder of the creation, the *Coral-Insect*, with whose stupendous works, the moles and breakwaters of human construction are no more to be compared, than the *Picts'* wall to the shaggy mountains against whose hardy warriors it was intended for a barrier. These feeble insects, apparently so destitute of the power or means of producing so wonderful a result, are gradually changing the face of the Pacific Ocean by their operations; from the deepest recesses of the waters, they work their way *perpendicularly upwards*, until they arrive at the surface, when their labour ceases. A platform is thus erected for the deposit of sea-weed, the dung of fowls, and other wreck, which, decaying, are washed into the interstices of the coral. Fresh accumulations of a similar kind take place, until, in process of time, a depth of soil is formed, sufficient for the vegetation of the seeds of plants, thrown up by the sea, or brought thither by the birds; and thus, by the most insignificant means, are prepared new spots for the habitation of man in future generations.

The larger islands are generally surrounded, at the distance of a mile and a half from the shore, by a belt of coral, which, forming an effectual barrier against the weeds and waves, affords a safe and commodious harbour within, for shipping of every description, and whence the natives may, without danger, conduct their fishing and other aquatic operations. Over this reef, the rolling billows of the ocean are driven with great violence by the trade-

winds. Sometimes they extend in an unbroken line a mile and a half, and rising twelve or fourteen feet above the surface, their white foaming edges, bending over, form graceful arches, glittering in the rays of a tropical sun as if studded with brilliants; then, with loud and hollow roar, falling in magnificent desolation in froth and spray over the broken surface of the coral.

It is a remarkable fact in the natural history of these barriers to the ocean, and one which displays the wisdom and goodness of the Creator, that in almost every place where a considerable stream of water from the land flows into the sea, an opening is formed in the reef, affording a safe inlet and outlet for vessels. It is probable, that the *fresh water* of these streams is against the operations of the tiny architects, who cannot dispense with the full proportion of the salts or other component parts of their native element, so essential either to the formation of the structure they raise, or to their own existence, or probably, both. It frequently happens, that on the reef on either side of these openings, small islets are formed, rising not more than four or five feet from the wave, but covered with verdure of the brightest green, and bristling with the stately Coconut tree. These little "Emerald Isles" impart inexpressible beauty to the landscape, and afford the native fisherman a commodious resting-place in the midst of his labours.

The appearance of the main islands from the sea, is romantic and interesting. The rocky shore, clothed in some instances to the water's edge, with trees and shrubs, which dip their graceful boughs into the agitated wave; the peaceful and verdant glens which show themselves at the openings, studded with the cottages of the natives peeping through the luxuriant foliage of the Pandanus or the Purau; the cultivated plantations extending to the feet of the mountains, and intersected with rivers and streamlets, which descend from the heights and ravines, and rush in irregular courses over their rugged beds, until they mingle their waters with those of the ocean; the whole crowned by the distant mountain, clothed with the luxuriant verdure of the tropics, and affording a magnificent back-ground to the picture; produces altogether a landscape, that in beauty and picturesque effect, may vie with any in the world.

The inland scenery is of an equally striking character. The landscapes are generally circumscribed in extent, but the towering piles of Basalt heaped in romantic confusion near the margin or source of some cool stream, that flows in silence at their base, or dashes over the rocky fragments that interrupt its progress; and the wild character of the deep and lonely glens, which frequently occur at the foot of the mountains, which latter, in their turn, present a bold and shaggy ascent, with their summits resting on the clouds, inspire the beholder with awe and astonishment. "Often," says Mr. Ellis, "when alone, or attended by one or two companions, I have journeyed through some of the interior parts of the islands, such has been the effect of the scenery through which I have passed, and the unbroken stillness which has pervaded the whole, that imagination unrestrained, might easily have induced us to believe that we were walking on enchanted ground."

Most of these islands are extremely fertile, and the natives cultivate them with considerable care. The catalogue of their edible plants and roots, embraces a sufficient variety.

The *BREAD FRUIT* (*artocarpus*) is the principal. The tree on which it grows is large and shady, its leaves are broad, and indented like those of the fig-tree, from

twelve to eighteen inches long, rather fleshy, and of a dark glossy green. It is propagated by shoots taken from the root, and bears fruit in five years. This fruit is about six inches in diameter, of a round or oval form, and when ripe, of a rich yellow tinge. It hangs generally in clusters of two or three on a small thick stalk. The Bread Fruit may be called the *staff of life* of these islanders, as it constitutes the chief article of their diet. Three, and sometimes four crops are produced in the year, and it continues to bear for fifty years. Besides its value as an article of food, the timber of the Bread-fruit tree, which is of a rich yellow colour at first, but afterwards assumes the appearance of mahogany, is the most valuable the natives possess, being employed in building their houses and canoes, and in the manufacture of articles of furniture. The bark also is used in the manufacture of the native cloth, and a valuable gum or resin is obtained by puncturing the bark, highly useful in caulking the seams of their canoes, and other purposes. The Missionaries have found no less than fifty varieties of this tree, having distinct names. The tree itself is one of the most splendid and beautiful objects to be met with among the rich and diversified scenery of a Tahitian landscape.

The TARO, or ARUM, ranks next in point of value as an article of food, and is cultivated with great care. It has a large solid and tuberous root, from nine to twelve inches long, and six in diameter. It has no stalk, but throws out a number of broad heart-shaped leaves from the crown, and the flower is contained in a sheath or spathe. There are thirty-three varieties with distinct names; all these, in their raw state, are exceedingly pungent, and even take the skin from the tongue or palate; but, when cooked, are palatable and nutritious, resembling the common potato more than any other root in the island.

The URI or YAM, (*Dioscoria alata*) is native, and flourishes well in all the islands. It is cultivated on small terraces, raised on the sunny sides of the hills, and enriched with manure. The roots intended for planting are kept until they begin to shoot, when the eyes are carefully cut out with a small part of the root attached, and dried. They are then put in the ground with the sprouts uppermost, and lightly covered with mould about an inch thick. This is one of the best-flavoured and most nutritive roots, which the islands produce.

The UMARA or SWEET POTATO (*Convolvulus batatas*); the PATARA, another root resembling the potato, highly farinaceous, and having a stem like the convolvulus; the NAHA, a large and beautiful kind of fern, with a tuberous root; the berries of the Nono (*Morinda citrifolia*); the stalks of the Poho (*Convolvulus Braziliensis*); are also in requisition as articles of food.

The F'ia, or ARROW ROOT, (*Chaclea tacca*), is indigenous and abundant. It is sometimes cultivated, but grows spontaneously on the high sandy banks near the sea, or on the sides of the mountains; in growth it resembles the potato; when cultivated, however, the roots are much finer. A single root, uncut, is planted, and a number of tuberous roots, about the size of large new potatoes, are formed at the extremities of fibres proceeding from it. The leaves are of a light green colour, and deeply indented; they are not attached to one common stem, but each leaf proceeds directly from the root. The flower-stem rises in a single shaft, resembling a reed or arrow, (whence its name,) three or four feet high, crowned with a tuft of light green petalled flowers; these are succeeded by a bunch of green berries, resembling those of the potato.

The FRUITS of Polynesia are not numerous.

The HAARI, or COCOA NUT, (*Cocos nucifera*), is the most serviceable; it will grow in any soil or situation, and requires no care, except when quite young. Its stem is cylindrical, being three or four feet in diameter at the root, and tapering to about six inches at the top. It has no branches, but shoots up in one bold stem sixty or seventy feet, bearing at the top a crown of long green-fringed leaves, like a graceful plume waving to the wind. Its timber is used for shears, domestic utensils, wall-plates, &c.; the leaves are converted into screens for their houses, baskets, bonnets, floor-mats, &c.; the fibres of the husk that covers the fruit into ropes, and all kinds of cordage, and the shells into every variety of drinking and other cups, bottles, &c. The fruit, in its several stages towards perfection, which probably occupies not less than twelve months, is prepared in different ways for food. The liquor contained in the shell, before the kernel begins to form, is a delicious drink, per-

fectly clear, and equal to the best lemonade. Formerly they were used in profusion on every occasion, but at present the exportation of oil has induced the natives to preserve them for its preparation.

"It is impossible," says Mr. Ellis, after giving a most minute and interesting description of these trees, "to contemplate either the bread-fruit or the cocoa-nut-tree, in their gigantic and spontaneous growth, their majestic appearance, the value and abundance of their fruit, and the varied purposes to which they are subservient, without admiring the wisdom and benevolence of the Creator, and his distinguished kindness towards the inhabitants of these interesting islands."

The Muia, PLANTAIN and BANANA, (*Musa paradisica* and *Musa sapientum*), are also indigenous. Not less than thirty varieties are cultivated by the natives. The stem is from eight to twelve feet high; the leaves eighteen inches to two feet wide, and from twelve to sixteen feet long, and of a beautiful pea-green colour. The fruit is about nine inches long, something like a cucumber, and of a bright yellow; each plant produces sixty or seventy fruit on one stalk, and, when ripe, the plant is cut down, and succeeded by the shoots or suckers which spring from the original root. Its flavour resembles a soft, sweet, but not juicy pear.

The Vi, or BRAZILIAN PLUM, (*Spondias dulcis*), is grown in great abundance. In form and taste it resembles our *Magnum bonum*, but, instead of a stone, has a hard spiked cone, containing several seeds. The trunk is frequently four or five feet in diameter. The fruit hangs in bunches, and are often so plentiful that the ground under the trees is covered with them.

The Ahia, or Jambo, (*Eugenia mullaccensis*), resembles a small oblong apple, of a beautiful bright red, with a white juicy pulp.

The Mape, or Rata, a native CHESTNUT (*Tuscul edulis*), is sometimes eaten. It is a fine spreading tree, but of a singular form. When about six inches in diameter, four or five projections appear on the trunk, extending from the root to the branches; these keep increasing until they have the appearance of boards fixed to the trunk, (which ceases growing,) like the radii or fliers of a winnowing-machine. Though not more than two inches thick, they are sometimes four feet wide, and are used by the natives as boards for various purposes, but they are very perishable.

The To or SUGAR CANE, (*Saccharum officinarum*), grows in greater perfection than in any other part of the world. It was formerly eaten raw, but since the residence of the missionaries amongst them, the natives have learned the mode of preparing sugar from it.

A vast number of useful plants and roots have been introduced by the missionaries, such as vines, oranges, lemons, citrons, tamarinds, pine-apples, &c. which have thriven well. W heats, from some cause hitherto unaccounted for, will not grow to advantage; but a sufficient abundance of other edible vegetables, fruits, and roots, are almost spontaneously produced, to meet the demands of the most fastidious epicures.

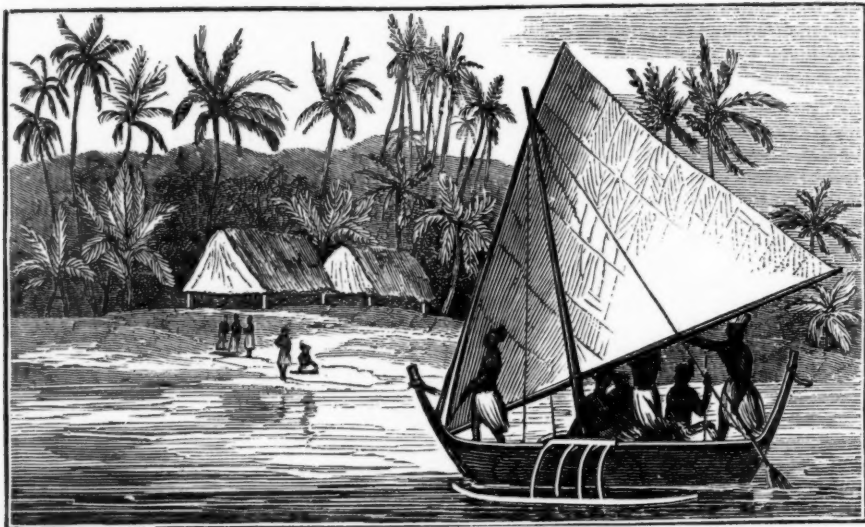
"Here man," says Mr. Ellis, "seemed to live only for enjoyment, and appeared to have been placed in circumstances where every desire was satisfied, and where it might be imagined even the apprehension of want was a thing unknown."

"Amid the unrestrained enjoyment of a bounty so diversified and profuse, it is hardly possible to suppose, that the divine Author of all should neither be recognised nor acknowledged, or that his very mercies should foster insensibility, and alienate the hearts of the participants of his bounty. Such, however was the melancholy fact," although

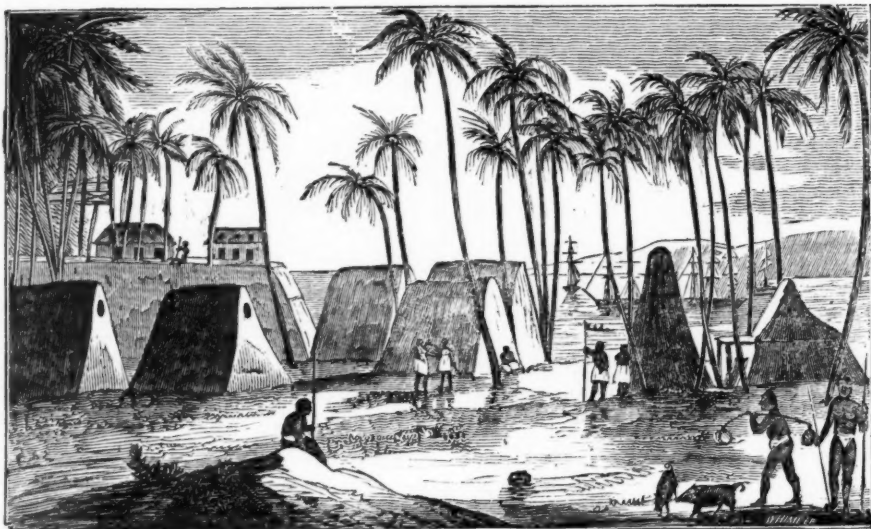
The soil, untilled,
Poured forth spontaneous and abundant harvests;
The forests cast their fruits, in husk or rind,
Yielding sweet kernels or delicious pulp,
Smooth oil, cool milk, and unfermented wine,
In rich and exquisite variety;
On these the indolent inhabitants
Fed without care or forethought.

[PART II. in a future Number.]

POLYNESIAN SCENERY.



VIEW OF AN ISLAND IN THE KRUSENSTERN GROUP.



PORT OF HANAROUROU.

FAMILIAR ILLUSTRATIONS OF NATURAL PHENOMENA.

No. III. THE TIDES OF RIVERS.

THERE is a circumstance connected with the subject of the tides, which may have created a difficulty in the minds of some of our readers. When we speak of a tide-wave advancing at the rate of fifty or a hundred miles in an hour, we are apt at once to think of a *current* of water running at that rate, whereas, every body knows that it is a very strong tide that runs at the rate of four miles an hour. A little attention will show, that the advance of the ridge of the *tide-wave* is a very different thing from the motion of a *current* in the water. If a ship were becalmed at the entrance of the English channel, she would be *lifted* by the high-water wave, we will suppose at three o'clock in the afternoon. A fleet riding at anchor in the Downs, would be *lifted* by the very same tide-wave at twelve o'clock that night; the wave having passed all the way up the channel, at the rate of about fifty miles an hour. But the motion of the water which would carry the first ship *along*, or be observed as the rate of the current *past*

the ships at anchor, would probably not be above two miles an hour; and might not be even in the same direction with that of the tide-wave.

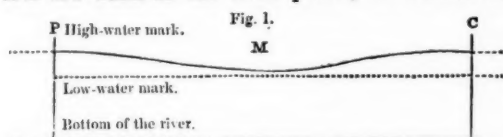
Any person may easily convince himself that the motion of waves is not necessarily accompanied with a current of the water in the same direction, by throwing any light substance into the sea a little beyond the breakers, or into a piece of standing water, the surface of which is ruffled. He will see that such a floating body rises and falls, with the motion of the waves, but does not perceptibly move towards the shore.

A field of corn gives another very good instance of *waves*, without any advancing *motion* of the parts which form them. We may see the waves chase one another over the bending tops of the corn; but every ear which is bent down, comes back to its first position.

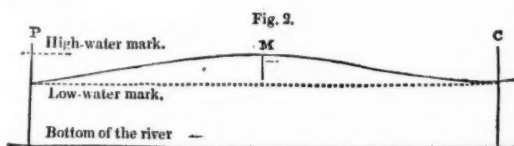
In the tides, however, there is usually *some* current occasioned by the advance of the tide-wave: and this current is stronger in places where the sea is shallowest, or in funnel-shaped channels, such as the mouth of the Severn, or of other large rivers. It must be carefully observed, however, that the change

in the *direction* of this current is quite a different thing from the change in the *rise* and *fall* of the water.

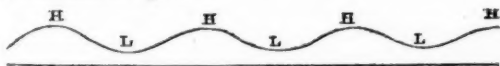
The nature of the tide in large rivers will be easily understood, after what has been said (in No. II., p. 79.) respecting the tides in narrow seas. Whenever the top of the tide-wave reaches the mouth of a river, it raises the water there, and sends an undulation up the river, which advances with greater or less rapidity according to circumstances, checking the current, but not always driving it back; and causing high water in succession, as it reaches the different parts of the river. The tide-wave advances up the Thames at about twenty miles an hour. We have no rivers in England which are long enough to show the whole effect of the tide-wave in its progress; but in the great rivers of America, and in other parts of the world, it may be distinctly traced. Thus, in the river Delaware, upon which the town of Philadelphia is built, it is high water at Philadelphia at the same time as at the mouth of the river, one hundred and forty miles distant: and about half way down there is low water at the same instant. Again, when it is high water at the *middle* point, it is low water at the two extremities. The surface of that part of the river which lies between the capes, at the mouth of the Delaware, and the city of Philadelphia, forms a long wave, the distance from ridge to ridge being one hundred and forty miles: when it is high water at Philadelphia and at the mouth, the wave has the position represented in fig. 1, in which *p* represents Philadelphia and *c* the capes: and, when it is low water at the same points, the surface has



assumed the position represented in fig. 2: the water having sunk at the two extremities, and risen in the middle.



In rivers of very great length there may be several of these tide-waves going on at once, causing high water at every ridge, and low water at every hollow; and producing the different variations of the tide at the corresponding points of each wave, in the manner represented in fig. 3.



It is, therefore, a great mistake to suppose that when it is high water, for instance, at London Bridge, the water is at the same level all the way down the river. The water will continue to rise at London Bridge for some time after it has begun to sink at Gravesend; and again will be sinking at London Bridge for an hour after the water has begun to rise at Gravesend.

It will be seen also, that, although the water is much deeper, at any *place*, at high water than at low water, yet, in a whole river of great extent there may not be much more water at one time than at another; and that the currents caused by the tides will, upon the whole, act as much one way as another.

On the coast of Suffolk, near where an opening has been lately made into the sea, to form a canal which shall be navigable for ships to Norwich, a circumstance is said to occur, which shows very clearly the motion of the tide-wave up the channel of a river. Upon great part of that coast, the sea is constantly throwing up a shingly beach, which stops the straight course of the rivers into the sea, and causes them to run along within a few yards of the sea for several miles, before they can find an outlet. Such a river runs near the coast at *c*, where its mouth originally was: but it is there turned to the southward by the high beach, and really enters the sea at *m*, some miles lower down. Now it is high water in the sea at *a* when the tide-wave, coming from the north, arrives there; it is high water at *m* somewhat later; but it is not high water at *c*, in the river, until the tide-wave from *m* has been propagated along the narrow and winding bed of the river from *m* to *c*. It so happens, that nearly six hours are taken up in the progress of the tide-wave from *a* round *m* to *c*; so that by the time it is high water at *c* in the river, it is low water in the sea at *a*, only a few yards distant; and, again, when it is low water at *c*, it is high water at *a*.



The height of the tides, at different places, depends upon the direction and form of the coast, and other causes, which vary with almost every different situation. The highest tides upon the coast of England occur in the Severn, where the tide-wave comes in, in one large ridge, accompanied with a roaring noise, and with such violence as often to prove destructive to the small craft; it rises there to the height of forty feet.

The reason of this great height of the tide is easily seen. The mouth of the Bristol Channel is very wide, and opens to the South-west, so as to receive the tide-wave from the Atlantic Ocean; but the Channel becomes narrower by degrees, and near Chepstow is very much contracted; the water is, therefore, heaped up at the upper end of the Channel, much above the level to which it would otherwise rise.

We have now seen that the action of the moon upon the ocean produces the constant and beneficial changes in the waters of the sea and of rivers, which are called tides. The action of the sun produces also tides; but the effect is less, since the sun is at a much greater distance from the earth than the moon is. The influence of the sun is, however, very sensible in causing the *spring* and *neap* tides. When the sun and moon are either together, or directly opposite to each other, that is at *new* and *full* moon, the tides occasioned by each happen at the same hour; they are, therefore, much greater than ordinary, or there are *spring-tides*. But when the moon is halfway between these two positions, or at the *quarters*, if, at any place, it would be *high* water by the action of the moon, it would be *low* water by the action of the sun. The sinking thus occasioned by the sun, takes off from the rising caused by the moon; the tide, therefore, does not rise so high as the average, or there are *neap-tides*. C.

WHAT I do, thou knowest not now; but thou shalt know hereafter—is the unvaried language of God in his providence. He will have CREDIT every step. He will not assign reasons, because he will exercise faith.—CECIL.

A WORD IN SEASON.

SOME years ago, a young man of social temper and affable manners was travelling by one of the stage-coaches. He had early entered into the military life, had seen real service, and evinced by his deportment that he was no stranger to the society of gentlemen. He had, however, a fault too common, and too absurd, to find an advocate among men of sense; he was in the constant habit of swearing. While the horses were changing, a gentleman, who sat on the same seat with him, took him by the arm, and requested the favour of his company in a short walk. When they were so far retired as not to be overheard, his fellow-traveller observed, "Although I have not the honour of your acquaintance, I perceive, sir, that your feelings are those of a gentleman; and that nothing can be more repugnant to your wishes than giving unnecessary pain to one of your company."

The young officer started, and replied, "Most certainly, sir; I hope I have committed no offence of that sort!" "You will pardon me," replied the other, "for pointing out an instance in which you have not altogether avoided it." "Sir," said he, "I shall be much your debtor for so friendly an act; for, upon my honour, I cannot conjecture in what I have transgressed." "If you, sir," continued the gentleman, "had a dear friend, to whom you were under unspeakable obligations, should you not be deeply wounded by any disrespect to him, or even by hearing his name introduced and used with a frequency of repetition and a levity of air incompatible with the regard due to his character?" "Undoubtedly, and I should not permit it; but I know not that I am chargeable with indecorum to any of your friends." "Sir, my God is my best friend, to whom I am under infinite obligations. I think you must recollect that you have frequently, since we commenced our journey, taken His name in vain. This has given to me heartfelt pain." "Sir," replied the young man, "with a very ingenuous emphasis, 'I have done wrong. I confess the impropriety. I am ashamed of a practice, which I am sensible has no excuse; but I have imperceptibly fallen into it; and I really make use of oaths without being conscious that I do so. I will endeavour to abstain from it in future, and as you sit next to me on the coach, I shall thank you to touch my elbow as often as I trespass.'"

This was agreed upon. The horn sounded, and the travellers resumed their places. In the space of four or five miles, the officer's elbow was joggled every few seconds. He always coloured, but bowed, and received the hint without the least symptom of displeasure, and in a few miles more so mastered his propensity to swearing, that not an oath was heard from his lips during the remaining, which was the greater, part of the journey. H. W.

COMMON happiness is sustained, not by great exertions, which are in the power of a few, and happen rarely even to them, but by great numbers doing every one a little, every one something in his particular province, to his particular neighbourhood. This is the way in which Providence intended society to be carried on, and beneficence to be exercised.—PALEY

THERE is small chance of truth at the goal, where there is not a child-like humility at the starting-post.—COLERIDGE.

THE bark of a tree contains an oily juice, which, when it is in greater plenty than can be exhaled by the sun, renders the plant evergreen. Such is the state of the man whose virtue is proof against the scorching heats of temptation and persecution: he is "like a green olive tree," in the courts of the temple, "his leaf shall not wither."—BISHOP HORNE.

DIVISION OF LABOUR IN MANUFACTURES.

THE greatest improvement in the productive powers of labour, and the greater part of the skill with which it is any where directed, or applied, seem to have been the effects of the division of labour; which effects, in the business of society, will be better understood by considering how it operates in some particular manufactures.

It is commonly supposed that the *division of labour* is carried furthest in some trifling manufactures, which is an error probably founded upon this circumstance; that the number of workmen, in every branch of these manufactures, being small, may be collected in the same factory, and placed at once under the view of the spectator; whereas in those manufactures destined to supply the great wants of the people, we can seldom see at once more than those employed in one single branch: therefore the division may be greater, and yet not so obvious. Take an example of the division of labour; a person unacquainted with the business of pin-making, could scarcely make a single pin a day; but, by dividing the business into various branches, which are now distinct trades, each person may be considered as making 4800 pins a day.

In every other manufacture the effects of the *division of labour* are similar to what they are in this, though they may not be reducible to so great simplicity: hence the increase of the productive powers of labour; the advantages of which have caused the separation of different employments. This separation is carried furthest in countries most improved: what is the work of one man in a *rude state of society* being generally that of several in an *improved* one. Hence the different trades in the woollen and linen manufactures, from the growers of the wool or flax, to the dressers of the cloth.

Agriculture does not admit of so many subdivisions of labour as manufactures: the different sorts of labour, in the former, returning with seasons, no man can be constantly employed in any one of them; hence its unimproved state, in all countries, compared with manufactures. In agriculture, the labour of the rich country is not always much more productive than that of the poor. The corn of Poland is generally as good, and as cheap, as that of England, notwithstanding the improved state of the latter. But in manufactures, Poland can pretend to no such competition.

The increase in the quantity of work, which, in consequence of the division of labour, the same number of people are capable of performing, is owing to three different circumstances.

1. To the increase of dexterity in every particular workman, by reducing every man's business to one simple operation, and by making this operation the sole employment of his life. A common smith, unaccustomed to making of nails, cannot make more than two or three hundred nails a-day; whereas lads, under twenty years of age, who never exercised any other trade but that of making nails, can make 2300 nails in a day. Neither is this one of the simplest operations, and of course not one where the dexterity of the workman is the greatest.

2. To the saving of the time which is commonly lost in passing from one species of work to another. It is impossible to pass very quickly from one kind of work to another. A country weaver, who cultivates a small farm, must lose a deal of time in passing from the loom to the field. A man commonly saunters a little in turning his hand from one employment to another; and when he first begins the new work, it is seldom with spirit; hence the habit of indolent

careless application acquired by every country workman, who is obliged to change his tools and work every half hour.

3. Labour is much abridged by the application of proper machinery. The invention of those machines, by which labour is so much facilitated and abridged, seems to have been owing to the *division of labour*: for men are likely to discover the readier methods of attaining any object, when their whole attention is directed towards that single object. It is natural also, that out of many workmen employed in each branch of labour, some one or other should find the readiest method of performing their own particular work. It is a fact, that a great part of the machines used in those manufactures in which labour is most subdivided, were the inventions of common workmen. In steam-engines, one of the greatest improvements was discovered by a boy who wanted to *save* his labour. Many improvements in machinery have been made by the ingenuity of the makers of machines; and not a few by philosophers, or men of speculation; whose trade is *not to do any thing, but to observe every thing*. Philosophy, like other employments, is not only a trade, but is subdivided into several classes, which, as in every other business, improves dexterity, and saves time.

It is the great multiplication of the productions of the different arts, in consequence of the division of labour, which occasions, in a well-regulated society, that universal opulence which extends itself to the lowest ranks of the people.

Observe the accommodation of the artificer, or day-labourer, in a civilized and thriving state, and you will perceive that the number of people employed in procuring him accommodation exceeds all computation. What a variety of labour is necessary to produce the tools of the meanest workman; the shears, for instance, with which the shepherd clips the wool! We might examine also his dress, or furniture; reflect on the different hands employed in preparing his bread, and his beer, the glass, the window which lets in the light, and keeps out the wind and the rain; and it will appear, that without the assistance of *many thousands*, the very meanest person in a *civilized country* could not be accommodated, in what is *falsely* called an easy and simple manner.—*Wealth of Nations*.

WHAT an immense workman is God! in miniature as well as in the great. With the one hand, perhaps, he is making a ring of one hundred thousand miles in diameter, to revolve round a planet like Saturn, and with the other is forming a tooth in the ray of the feather of a Humming-bird, or a point in the claw of the foot of a microscopic insect. When he works in miniature, every thing is gilded, polished, and perfect, but whatever is made by human art, as a needle, &c., when viewed by a microscope, appears rough, and coarse, and bungling.—BISHOP LAW.

A PAGAN moralist hath represented the folly of an attachment to this world, almost as strongly as a Christian could express it. "Thou art a passenger," says he, "and thy ship hath put into a harbour for a few hours. The tide and the wind serve, and the pilot calls thee to depart, and thou art amusing thyself, and gathering shells and pebbles on the shore, till they set sail without thee." So is every Christian, who, being upon his voyage to a happy eternity, delays, and loiters, and thinks, and acts, as if he were to dwell here for ever.—JORTIN.

THE friendship of high and sanctified spirits, loses nothing by death but its alloy; failings disappear, and the virtues of those, whose "faces we shall behold no more," appear greater and more sacred when beheld through the shades of the sepulchre.—ROBERT HALL.

NIGHT.

NIGHT is the time for rest;
How sweet when labours close,
To gather round an aching breast
The curtain of repose;
Stretch the tired limbs, and lay the head
Upon our own delightful bed!
Night is the time for dreams;
The gay romance of life,
When truth that is, and truth that seems,
Blend in fantastic strife;
Ah! visions less beguiling far
Than waking dreams by daylight are!
Night is the time for toil;
To plough the classic field,
Intent to find the buried spoil
Its wealthy furrows yield;
Till all is ours that sages taught,
That poets sang, or heroes wrought.
Night is the time to weep;
To wet with unseen tears
Those graves of memory where sleep
The joys of other years;
Hopes that were angels in their birth,
But perished young, like things on earth!
Night is the time to watch;
On Ocean's dark expanse,
To hail the Pleiades, or catch
The full Moon's earliest glance,
That brings unto the home-sick mind
All we have loved and left behind.
Night is the time for care;
Brooding on hours mis-spent,
To see the spectre of Despair
Come to our lonely tent;
Like Brutus 'midst his slumbering host,
Startled by Cæsar's stalwart ghost.
Night is the time to muse!
Then from the eye the soul
Takes flight, and with expanding views
Beyond the starry pole,
Descries athwart the abyss of night
The dawn of uncreated light.
Night is the time to pray;
Our Saviour oft withdrew
To desert mountains far away,
So will his followers do;
Steal from the throng to haunts untrod,
And hold communion there with God.
Night is the time for death;
When all around is peace,
Calmly to yield the weary breath
From sin and suffering cease;
Think of Heaven's bliss, and give the sign
To parting friends—such death be mine!

JAMES MONTGOMERY.

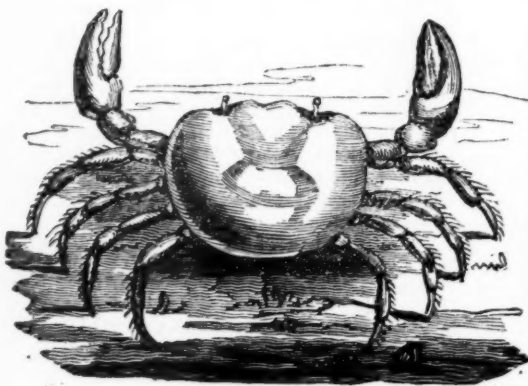
THE LAND-CRAB. (*Cancer ruricola*).

THE Land-Crab is a native of the Bahama Islands, where it is found in immense numbers. The habits of this animal are unlike those of the rest of its class, and highly curious in themselves.

Land-crabs do not, like most other crustaceous animals, live near salt water, but take up their abode for the greatest part of the year in holes in the ground, hollow trunks of trees, and other places of the same description, and inhabit the mountainous districts of the islands, many miles from the seashore; but although they make these places their usual haunt, it is necessary for them, once a year, to repair to the sea for the purpose of depositing their spawn. They prepare for their annual migration about the month of April or May, and having mustered in immense numbers, the procession sets forward with all the regularity of an army, under the guidance of an experienced commander.

Their destination being the sea, they instinctively move in a direct line to the nearest coast: no obstacle

which they can possibly surmount will induce them to turn from their course, for if even a house stands in their way, they endeavour to scale its walls, in which they sometimes succeed; and should a window remain open, they are not unlikely to direct their march over the bed of some heedless sleeper. If, however, a large river crosses their track, they continue to follow its course without attempting to cross it.



THE LAND CRAB.

It is said, that they are commonly divided into three battalions, of which the first consists of the strongest and boldest males, who, like pioneers, march forward to clear the route. They are often obliged to halt for want of rain, and go into the most convenient encampment till the weather changes. The main body consists of females, who never leave the mountains till the rain has set in for some time; they then descend in regular order, formed into columns of the breadth of fifty paces and three miles in depth, and so close that they almost cover the ground. Three or four days after this, the rear guard follows; a straggling undisciplined tribe, consisting of males and females, but neither so robust or vigorous as the former parties. The night is their chief time of proceeding. When terrified they march back in a confused manner, holding up their nippers and clattering them loudly, to intimidate their enemies. Their general food consists of vegetables; but if any of their companions should become maimed, and unable to proceed, they are greedily devoured by the rest.

After a march of two, and sometimes three months, in this manner, they arrive at their destined spot on the sea-coast; they immediately enter the water, and after the waves have washed over them several times, retire to holes in the rocks, and other hiding-places, where they remain until the period of spawning. They then once more seek the water, and shaking off their eggs, leave them to the chance of being hatched, or devoured by tribes of hungry fish, who have already repaired to the spot in countless shoals, in expectation of their annual treat. The eggs that escape are hatched under the sand; and, soon after, millions at a time of the little crabs are seen quitting the shore, and slowly travelling up to the mountains. The old ones, however, are not so active to return: they have become so feeble and lean, that they can hardly crawl about. Most of them, therefore, are obliged to continue in the flat parts of the country till they recover; making holes in the earth, into which they creep, and cover themselves up with leaves and dirt: here they throw off their old shells, which they leave behind them, nearly whole. At this time they are quite naked, and continue almost without motion for about six days, during which time they become so fat, as to

be considered delicious food. In about six weeks, the new shell has become tolerably hard, and the creatures may be seen slowly returning to their mountain-haunts. In some of the sugar-islands, it is said they form no inconsiderable portion of the food of the negroes, who are extremely dexterous in their mode of seizing them, so as to avoid their nippers.

ANNIVERSARIES IN SEPTEMBER.

MONDAY, 23rd.

AUTUMNAL QUARTER begins; the Sun enters the sign Libra. 768 *Pepin*, founder of the Carlovingian race, died; he was the first regularly consecrated King of France.

1803 Agra and Delhi taken by the British.

TUESDAY, 24th.

1640 *Charles I.* convoked the Parliament by which he was eventually dethroned.

WEDNESDAY, 25th.

1492 *Columbus* sailed from Cadiz on his second voyage of discovery.

THURSDAY, 26th.

St. CYPRIAN, Bishop of Carthage, was converted to Christianity by Cæcilius, and became highly eminent, both as a preacher and writer. In the persecution under Decius he was proscribed, but saved himself by flight; he also escaped infection during the plague which raged in Carthage, though he exposed himself constantly to it by a diligent attention on the sick. He was banished by Valerian, but recalled, and condemned to death, by Galerius Maximus, Proconsul of Africa, in 258. His works remain, and have been translated into English by Dr. Marshall.

1529 Vienna besieged by the Turks under Solymán the Magnificent. He was the first Ottoman prince who penetrated so far into the heart of Europe.

1777 *General Howe*, with the British troops, entered Philadelphia. the American congress having removed to Lancaster.

FRIDAY, 27th.

1087 *William Rufus* crowned at Westminster.

1136 *Battle of Tinchebray*, in which Robert, eldest son of William the Conqueror, was defeated and taken prisoner by his brother, Henry II. of England, who kept him confined the remainder of his life.

1590 *Urban VII.* died at Rome, having enjoyed the Pontificate but twelve days.

1729 Fire at Constantinople, in which 12,000 houses were consumed, and more than 7000 human beings perished.

SUNDAY, 29th.

SEVENTEENTH SUNDAY AFTER TRINITY.

MICHAELMAS DAY.—The Festival of St. Michael and All Angels was instituted in the year 487, to commemorate the ministry of these Holy Angels, the messengers of good-will towards men.

At the Reformation, though the worship of angels was expressly condemned as superstitious and idolatrous, this festival was preserved, but restrained to its original intent, of returning thanks to God, who, (to use the words of the Collect for the day,) "has constituted the service of men and angels in a wonderful order," and to pray that they may be appointed to succour and defend us on earth as they do constantly serve God in heaven.

Michaelmas is the third quarter, or term, for the payment of rents, &c., and stands in the place of Martinmas, the-old or cross quarter; and the custom of entertaining those who came to pay rent with a fat goose was transferred to it.

1560 Died, at Stockholm, aged seventy, *Gustavus Vasa*, the deliverer of his country from the Danish yoke.

1613 The New River, planned and executed by Sir Hugh Myddelton, completed.

1827 *Captain Parry*, from his arctic expedition, and *Captain Franklin*, from a voyage of discovery in North America, arrived at the Admiralty within an hour of each other.

THE diffusion of seeds over the face of the earth is accomplished by means very wonderful, and is among the many proofs of the wisdom of God. Such seeds as are heavy, and immoveable by more obvious means, such as the stones and seeds of fruits, are commonly swallowed both by birds and beasts, and conveyed in their stomachs whithersoever they rove; and are ultimately planted, not only in the neighbouring fields and countries, but also in more distant regions. Others, of considerable weight, are lodged permanently in a large and light husk, which, together with the seed contained in it, is easily separated after the seed has become ripe, and blown by the wind over extensive tracts. Others still are winged and feathered in such a manner as to be easily wafted in the breeze, and spread through all the surrounding country. A young gentleman once, in my presence, examining a seed of a particular kind of grass, and finding a beautiful feather thus adhering to it, was so struck with this contrivance for the dispersion of such seeds over the earth, that he exclaimed, "the man must be a brute, who does not believe in the existence of a God."—DWIGHT.

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